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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/686,878
Filing Date: October 16, 2003
Appellant(s): HSU ET AL.

Brian C. Kunzler Registration No. 38,527
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 22, 2011 appealing from the Office action mailed November 22, 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for rapidly, deterministically transferring data, the apparatus comprising:
a processor processing data;
a volatile memory storing the data;
a boot control module booting the processor with a standard operating kernel under a normal operating condition and deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory, wherein the reboot occurs without a loss of the data within the volatile memory; and
the data transfer kernel loading only a data save operation in response to rebooting the processor with tile data transfer kernel, tile data save operation saving the data in the volatile memory to a storage device: and shutting down the processor in response to completing the data save operation.

2. (Canceled)

3. (Previously Amended) The apparatus of claim 1, wherein the data save operation is selected from the group consisting of a storage configuration operation, a transfer process loading operation, a data transfer operation, and a system shutdown operation.

4. (Canceled)

5. (Previously Amended) The apparatus of claim 1, further comprising a memory module comprising data bits for marking data to be saved during the data save operation.

6. (Previously Presented) The apparatus of claim 5, the standard operating kernel further marking data to be saved during a data save operation.

7. (Previously Presented) The apparatus of claim 1, the data transfer kernel configuring the storage device for specialized data save operations.

8. (Previously Presented) The apparatus of claim 1, the data transfer kernel conducting a power down procedure.

9. (Canceled)

10. (Currently Amended) An apparatus for rapidly, deterministically transferring data to a storage device, the apparatus comprising:

a storage device non-volatilely storing data;

a data transfer kernel supporting data saving operations;

a computer in communication with the storage device, the computer deterministically terminating all existing processes by loading the data transfer kernel during a reboot procedure in response to an abnormal operating condition that threatens the loss of data in a volatile memory, wherein the reboot procedure occurs without a loss of the data within the volatile memory; and

the data transfer kernel loading only a data save operation in response to rebooting the computer with the data transfer, the data save operation saving the data in the volatile memory to the storage device, and shutting down the computer in response to completing the data save operation.

11. (Previously Presented) The apparatus of claim 10, the data transfer kernel exclusively supporting devices and processes required to save data to the storage device.

12. (Canceled)

13. (Currently Amended) An apparatus for rapidly, deterministically saving data, the apparatus comprising:

means for processing data;

means for volatilely storing the data; and

means for booting the processing means with a standard operating kernel under a normal condition and deterministically terminating all existing processes by rebooting the processing means with a data transfer kernel without a loss of data in the volatile storing means in response to the abnormal operating condition, the data transfer kernel loading only a data save operation in response to rebooting the processing means with the data transfer kernel, the data save operation saving the data to a non-volatile storage, and the data transfer kernel shutting down the processing means in response to completing the data save operation.

14. (Previously Presented) The apparatus of claim 13, further comprising means for configuring the non-volatile storage for data save operations.

15. (Canceled)

16. (Previously Presented) The apparatus of claim 13, further comprising means for marking the data to be saved during the data save operation.

17. (Currently Amended) A system for rapidly, deterministically saving data to a storage device, the system comprising:

a processor processing data;

a memory volatilely storing the data;

a storage device non-volatilely storing the data;

a boot control module booting the processor module with a standard operating kernel under a normal operating condition and deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens the loss of the data in the memory, wherein the reboot occurs without a loss of the data in the memory; and

the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel, the data save operation saving the data in the memory to the storage device, and shutting down the processor in response to completing the data save operation.

18. (Previously Presented) The system of claim 17, the standard operating kernel marking the data in the memory to be saved by the data transfer kernel during the data save operation.

19. (Previously Amended) The system of claim 17, wherein the data transfer kernel exclusively supports devices, operations, and processes required to save data.

20. (Original) The system of claim 17, wherein the data transfer kernel configures the processor for data saving operations.

21. (Original) The system of claim 17, wherein the data transfer kernel configures the storage device for specialized data saving operations,

22. (Previously Presented) The system of claim 17, the data transfer kernel conducting a power down procedure.

23. (Canceled)

24. (Currently Amended) A method for rapidly, deterministically saving data, the method comprising:

detecting a data save condition that threatens the loss of data in a volatile memory;

deterministically terminating all existing processes by rebooting a processor with a data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel, wherein rebooting the processor occurs without a loss of the data in the volatile memory;

saving the data in the volatile memory to the non-volatile storage device using the data save operation; and

shutting down the processor in response to completing the data save operation.

25. (Previously Presented) The method of claim 24, the data transfer kernel exclusively supporting devices, operations, and conducting processes required to save the data to the non-volatile storage device.

26. (Previously Presented) The method of claim 24, further comprising configuring the non-volatile storage device to receive the data.

27. (Previously Presented) The method of claim 24, further comprising marking the data to be saved by the data transfer kernel.

28. (Currently Amended) A non-transitory computer readable storage medium storing a computer readable program code for rapidly, deterministically saving data, the program code:

deterministically terminates all existing processes by rebooting a processor module with a data transfer kernel in response to an abnormal operating condition that threatens the loss of data stored in a volatile memory module, wherein the reboot occurs without a loss of data within the volatile memory module;

load only a data save operation in response to rebooting the processor module with the data transfer kernel;

transfers the data with the data save operation from the volatile memory module to a non-volatile storage device without a loss of data in the volatile memory module;

shuts down the processor module in response to completing the data save operation.

29. (Currently Amended) The computer readable storage medium of claim 28, the computer code marking data in the volatile memory module to be saved to the storage device.

30. (Previously Presented) The computer readable storage medium of claim 28, wherein the data transfer kernel exclusively supports devices, operations, and processes required to save data to the storage device.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in

the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6567899	Ghosh	7-2002
20030149967	Kamada	5-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims **1, 10, 13, 17, 24, 28** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim language for claim limitation: "loading only a data save operation", appears to be indefinite as to its meaning. A data save operation cannot be loaded, and loaded into what? The instructions to perform a data save operation can be loaded into memory. The steps or instructions of the data save operation can be performed or executed respectively. The Examiner will interpret this claim limitation as the instructions to perform a data save operation are loaded into a memory and are executed.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims **1, 3 - 7, 10, 11, 13 - 21, 24 - 30** are rejected under 35 U.S.C. 102(e) as being anticipated by **Ghosh et al.** (US Patent No. **6,567,899**).

With Regards to Claim 1, Ghosh discloses an apparatus for rapidly, deterministically transferring data, the apparatus comprising:

a) a processor processing data; (Ghosh col. 3, lines 38-42: data transferred between a host processor and a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor)

b) a volatile memory storing the data; (Ghosh col. 3, lines 38-42: a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache is lost or corrupted (implies volatile memory if data lost when power is lost))

c) a boot control module booting the processor with a standard operating kernel under a normal operating condition (Ghosh col. 6, lines 52-55: activation or

power up sequence (boot procedure), provide cache memory, power source switching functions, and memory reconfiguration functions; col. 10, lines 48-57: module of code of software to perform functions (boot control module)) and deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage) in response to an abnormal operating condition that threatens a loss of the data in the volatile memory, wherein the reboot occurs without a loss of the data within the volatile memory; (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Specification on page 5, lines 22-24 discloses that the reboot procedure is specifically completed to quickly terminate all active processes and prevent process stalling. Ghosh discloses activation or reboot procedure which reset the processor and terminates all currently active processes.

d) the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel, the data save operation

saving the data in the volatile memory to a storage device and shutting down the processor in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache would be lost or corrupted (implies volatile memory if data is lost when power is lost); col. 2, lines 13-15: power supply fails, data will be lost since cache memory is volatile; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

With Regards to Claim 3, Ghosh discloses the apparatus of claim 1, wherein the data save operation is selected from the group consisting of a storage configuration operation, a transfer process loading operation, a data transfer operation, and a system shutdown operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed)

With Regards to Claim 5, Ghosh discloses the apparatus of claim 1, further comprising a memory module comprising data bits for marking data to be saved during the data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claim 6, Ghosh discloses the apparatus of claim 5, the standard operating kernel further marking data to be saved during a data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claims 7, 21, Ghosh discloses the apparatus, system of claims 1, 17, the data transfer kernel configuring the storage device for specialized data save operations. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

With Regards to Claims 8, 22, Ghosh discloses the apparatus, system of claims 1, 17, the data transfer kernel conducting a power down sequence. (Ghosh col. 10, lines 17-23: system can be powered down; col. 6, lines 52-64: after next activation or power up sequence (reboot) cache memory data has been saved to a storage device; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

With Regards to Claim 10, Ghosh discloses an apparatus for rapidly, deterministically transferring data to a storage device, the apparatus comprising:

a) a storage device non-volatilely storing data; (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)
b) a data transfer kernel supporting data saving operations; (Ghosh col. 6, lines 52-

64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

c) a computer in communication with the storage device, the computer deterministically terminating all existing processes by loading the data transfer kernel during a reboot procedure (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage) in response to an abnormal operating condition that threatens the loss of data in a volatile memory, wherein the reboot procedure occurs without a loss of the data within the volatile memory; (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Specification discloses that the reboot procedure is specifically completed to quickly terminate all active processes. Ghosh discloses an initialization which reset the processor and terminates all currently active processes.

d) the data transfer kernel loading only a data save operation in response to

rebooting the computer with the data transfer, the data save operation saving the data in the volatile memory to the storage device and shutting down the computer in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache are lost or corrupted (implies volatile memory if data is lost when power is lost); col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

With Regards to Claim 11, Ghosh discloses the apparatus of claim 10, wherein the data transfer kernel exclusively supporting devices and processes required to save data to the storage device. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

With Regards to Claim 13, Ghosh discloses an apparatus for rapidly, deterministically saving data, the apparatus comprising:

a) means for processing data; (Ghosh col. 6, lines 52-64: stored data downloaded to a storage device; col. 10, lines 48-57: module of code of software to perform functions (boot control module))

b) means for volatilely storing the data detecting a data save condition comprising an abnormal operating condition that threatens the loss of data in a volatile memory; (Ghosh col. 9, line 52 - col. 10, line 9: compare system power to a predetermined threshold; if system power falls below threshold voltage comparator will set PFAIL to 1)

c) means for booting the processing means with a standard operating kernel under a normal condition and deterministically terminating all existing processes by rebooting the processing means with a data transfer kernel without a loss of data in the volatile storage means in response to the abnormal operating condition, the data transfer kernel loading only a data save operation in response to rebooting the computer with the data transfer, the data save operation saving the data to a non-volatile storage, and the data transfer kernel shutting down the processing means in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

With Regards to Claim 14, Ghosh discloses the apparatus of claim 13, further comprising means for configuring the non-volatile storage for data save operations. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller, which controls associated disk drives, is appropriately

configured)

With Regards to Claims 16, 27, 29, Ghosh discloses the apparatus, system, computer readable storage medium of claims 13, 24, 28, wherein comprising marking data to be saved during the data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claim 17, Ghosh discloses a system for rapidly, deterministically saving data to a storage device, the system comprising:

a) a processor processing data; (Ghosh col. 3, lines 38-42: data transferred between a host processor and a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor)

b) a memory volatilely storing the data; (Ghosh col. 3, lines 38-42: a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache is lost or corrupted (implies volatile memory if data lost when power is lost))

c) a storage device non-volatilely storing the data; (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

d) a boot control module booting the processor module with a standard operating kernel under a normal operating condition and deterministically terminating all

existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens the loss of the data in the memory, wherein the reboot occurs without a loss of the data in the memory; (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage) and

e) the data transfer kernel loading only a data save operation in response to rebooting the computer with the data transfer, the data save operation saving the data in the memory to the storage device and shutting down the processor in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

With Regards to Claim 18, Ghosh discloses the system of claim 17, the standard operating kernel marking the data in the memory to be saved by the data transfer kernel during the data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claims 19, 30, Ghosh discloses the system, computer readable storage medium of claims 17, 28, wherein the data transfer kernel is configured to support devices operations and processes required to save data. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 10, lines 48-57: module of code of software to perform functions (boot control module); col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

With Regards to Claim 20, Ghosh discloses the apparatus of claim 1, wherein the data transfer kernel is configured to support a data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

With Regards to Claim 24, Ghosh discloses a method for rapidly, deterministically saving data, the method comprising:

a) detecting a data save condition comprising that threatens the loss of data in a volatile memory; (Ghosh col. 9, line 52 - col. 10, line 9: compare system power to a predetermined threshold; if system power falls below threshold voltage comparator will set PFAIL to 1)
b) deterministically terminating all existing processes by rebooting a processor with

a data transfer kernel loading only a data save operation in response to rebooting the computer with the data transfer, the data save operation, wherein rebooting the processor occurs without a loss of the data in the volatile memory; (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache are lost or corrupted (implies volatile memory if data is lost when power is lost); stored data is saved; no loss of data in volatile memory; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses software for saving data as stated in Claim 1 above.

d) shutting down the processor in response to completing the data save operation. (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

With Regards to Claim 25, Ghosh discloses the method of claim 24, the data transfer kernel exclusively supporting devices, operations, and conducting processes required to save the data to the non-volatile storage device. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 10, lines 48-57: module

of code of software to perform functions (boot control module))

With Regards to Claim 26, Ghosh discloses the method of claim 24, further comprising configuring the non-volatile storage device to receive the data. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

With Regards to Claim 28, Ghosh discloses a non-transitory computer readable storage medium storing a computer readable program code for rapidly, deterministically saving data, the program code:

a) deterministically terminates all existing processes by rebooting a processor module with a data transfer kernel in response to an abnormal operating condition that threatens the loss of data stored in a volatile memory module, wherein the reboot occurs without a loss of data within the volatile memory module; (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

b) load only a data save operation in response to rebooting the processor module with the data transfer kernel; (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to

perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

c) transfers the data with the data save operation from the volatile memory module to a non-volatile storage device without a loss of data in the volatile memory module; (Ghosh col. 6, lines 60-64: stored data downloaded to a storage device (non-volatile storage))

d) shuts down the processor module in response to completing the data save operation. (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims **1, 3 - 7, 10, 11, 13 - 21, 24 - 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ghosh et al.** (US Patent No. **6,567,899**) in view of **Kamada et al.** (US PGPUB No. **20030149967**).

With Regards to Claim 1, Ghosh discloses an apparatus for rapidly, deterministically transferring data, the apparatus comprising:

a) a processor processing data; (Ghosh col. 3, lines 38-42: data transferred between a host processor and a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor)

b) a volatile memory storing the data; (Ghosh col. 3, lines 38-42: a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache is lost or corrupted (implies volatile memory if data lost when power is lost))

c) a boot control module booting the processor with a standard operating kernel under a normal operating condition (Ghosh col. 6, lines 52-55: activation or power up sequence (boot procedure), provide cache memory, power source switching functions, and memory reconfiguration functions; col. 10, lines 48-57: module of code of software to perform functions (boot control module)) and deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage) in response to an abnormal operating

condition that threatens a loss of data in the volatile memory, wherein the reboot occurs without a loss of the data within the volatile memory; (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Specification on page 5, lines 22-24 discloses that the reboot procedure is specifically completed to quickly terminate all active processes and prevent process stalling. Ghosh discloses activation or reboot procedure which reset the processor and terminates all currently active processes.

d) the data transfer loading only a data save operation in response to rebooting the processor with the data transfer kernel, the data save operation saving the data in the volatile memory to a storage device and shutting down the processor in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache are lost or corrupted (implies volatile memory if data is lost when power is lost); col. 2, lines 13-15: power supply fails, data will be lost since cache memory is volatile; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses file transfer operations that interface with OS software. (see Ghosh col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Kernel software is OS type software and Ghosh discloses interfacing with OS software for data transfers.

Ghosh does not specifically disclose a kernel for saving data (data save kernel). However, Kamada discloses a data save kernel. (Kamada paragraph [0040], lines 7-9: kernel saves and manages class loader and thread group; kernel used to save data)

It would have been obvious to one of ordinary skill in the art to modify Ghosh for a kernel for saving data as taught by Kamada. One of ordinary skill in the art would have been motivated to employ the teachings of Kamada reduce memory and processing time when a plurality of application are executed. (see Kamada paragraph [0008], lines 1-6)

With Regards to Claim 3, Ghosh discloses the apparatus of claim 1, wherein the data save operation is selected from the group consisting of a storage configuration operation, a transfer process loading operation, a data transfer operation, and a system shutdown operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed)

With Regards to Claims 4, 11, Ghosh discloses the apparatus of claims 3, 10, wherein the data transfer kernel is configured to support the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses kernel for saving data as stated in Claim 1 above.

With Regards to Claim 5, Ghosh discloses the apparatus of claim 1, further comprising a memory module comprising data bits for marking data to be saved during the data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claim 6, Ghosh discloses the apparatus of claim 5, the standard operating kernel is further marking data to be saved during a data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claims 7, 21, Ghosh discloses the apparatus, system of claims 1, 17, the data transfer kernel configuring a storage device for specialized data save operations. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control

mechanism such as a SCSI controller is appropriately configured)

With Regards to Claims 8, 12, 22, Ghosh discloses the apparatus, system of claims 1, 10, 17, the data transfer kernel conducting a power down sequence. (Ghosh col. 10, lines 17-23: system can be powered down; col. 6, lines 52-64: after next activation or power up sequence (reboot) cache memory data has been saved to a storage device; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 10, Ghosh discloses an apparatus for rapidly, deterministically transferring data to a storage device, the apparatus comprising:

a) a storage device non-volatilely storing data; (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

b) a data transfer kernel supporting data saving operations; (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

c) a computer in communication with the storage device, the computer

deterministically terminating all existing processes by loading the data transfer kernel during a reboot procedure (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage) in response to an abnormal operating condition that threatens the loss of data in a volatile memory, wherein the reboot procedure occurs without a loss of the data within the volatile memory; (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Specification discloses that the reboot procedure is specifically completed to quickly terminate all active processes. Ghosh discloses an initialization which reset the processor and terminates all currently active processes.

d) the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel, the data save operation saving the data in the volatile memory to the storage device and shutting down the computer in response to completing the data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation

completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache are lost or corrupted (implies volatile memory if data is lost when power is lost); col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses kernel for saving data as stated in Claim 1 above.

With Regards to Claim 13, Ghosh discloses an apparatus for rapidly, deterministically saving data, the apparatus comprising:

a) means for processing data; (Ghosh col. 6, lines 52-64: stored data downloaded to a storage device; col. 10, lines 48-57: module of code of software to perform functions (boot control module))

b) means for volatilely storing data; (Ghosh col. 9, line 52 - col. 10, line 9: compare system power to a predetermined threshold; if system power falls below threshold voltage comparator will set PFAIL to 1)

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 14, Ghosh discloses the apparatus of claim 13, further comprising means for configuring the non-volatilely storage for data save operations. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller, which controls associated disk drives, is appropriately

configured)

With Regards to Claims 16, 27, 29, Ghosh discloses the apparatus, system, computer readable storage medium of claims 13, 24, 28, wherein comprising marking the data to be saved during a data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claim 17, Ghosh discloses a system for rapidly, deterministically saving data to a storage device, the system comprising:

a) a processor processing data; (Ghosh col. 3, lines 38-42: data transferred between a host processor and a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor)

b) a memory volatilely storing the data; (Ghosh col. 3, lines 38-42: a memory storage device; col. 3, line 66 - col. 4, line 1: control bus for interconnecting memory apparatus with host processor; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache is lost or corrupted (implies volatile memory if data lost when power is lost))

c) a storage device non-volatilely storing the data; (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 18, Ghosh discloses the system of claim 17, the standard operating kernel marking the data in the memory to be saved by the data transfer kernel during the data save operation. (Ghosh col. 12, lines 38-46: cache memory contains dirty data (data marked as modified and must be save to disk storage))

With Regards to Claims 19, 30, Ghosh discloses the system, computer readable storage medium of claims 17, 28, wherein the data transfer kernel is configured to support devices operations and processes required to save data. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 10, lines 48-57: module of code of software to perform functions (boot control module); col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))
Ghosh discloses software for saving data as stated in Claim 1 above.
Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 20, Ghosh discloses the apparatus of claim 1, wherein the data transfer kernel is configured to support a data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; system on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 24, Ghosh discloses a method for rapidly, deterministically saving data, the method comprising:

a) detecting a data save condition comprising that threatens the loss of data in a volatile memory; (Ghosh col. 9, line 52 - col. 10, line 9: compare system power to a predetermined threshold; if system power falls below threshold voltage comparator will set PFAIL to 1)

b) deterministically terminating all existing processes by rebooting a processor with a data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel, the data save operation, wherein rebooting the processor occurs without a loss of the data in the volatile memory. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 2, lines 24-27: cache memory; when power fails or is interrupted, contents of cache are lost or corrupted (implies volatile memory if data is lost when power is lost); stored data is saved; no loss of data in volatile memory; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses software for saving data as stated in Claim 1 above.

Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 25, Ghosh discloses the method of claim 24, the data transfer kernel exclusively supporting devices, operations, and conducting processes required to save the data to the non-volatile storage device. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer operation completed; col. 10, lines 48-57: module of code of software to perform functions (boot control module))
Ghosh discloses software for saving data as stated in Claim 1 above.
Kamada discloses a kernel for saving data as stated in Claim 1 above.

With Regards to Claim 26, Ghosh discloses the method of claim 24, further comprising configuring the non-volatile storage device to receive the data. (Ghosh col. 10, lines 59-65: peripheral devices are configured; data control mechanism such as a SCSI controller is appropriately configured)

With Regards to Claim 28, Ghosh discloses a non-statutory computer readable storage medium storing a comprising computer readable program code for rapidly, deterministically saving data, the program code configured to:

a) deterministically terminates all existing processes by rebooting a processor module in response to an abnormal operating condition that threatens the loss of data storage in a volatile memory module, wherein the reboot occurs without a loss of data within the volatile memory module; (Ghosh col. 10, lines 17-23:

computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

b) load only a data save operation in response to rebooting the processor module with the data transfer kernel; (see Ghosh col. 6, lines 63-65: next activation or power up sequence (reboot); col. 10, lines 48-57: module of code of software to perform functions (data transfer module); col. 1, lines 26-35: cache controller interacts with operating system software to store data blocks on non-volatile storage)

c) transfer the data with the data save operation from the volatile memory module to a non-volatile storage device without a loss of data in the volatile memory module; (Ghosh col. 6, lines 60-64: stored data downloaded to a storage device (non-volatile storage))

d) shuts down the processor module in response to completing the data save operation. (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device)

Kamada discloses a kernel for saving data as stated in Claim 1 above.

(10) Response to Argument

I. The rejection of claims 1, 10, 13, 17, 24, and 28 under 35 under 35 U.S.C. §112, second paragraph is improper because one of skill in the art would be clearly understand that "loading only a data save operation" refers loading instructions to perform a data save operation into memory and executing those instructions.

1. Applicant argues in paragraphs [004] and [005] of Remarks the 112 Rejection addressing the claim limitation: *"loading only a data save operation". (Pages 9, 10)*

The Examiner stated in the last Office Action in reference to the 112 Rejection that there is no disclosure within the specification or original claims for the claim limitation: "load only a data save operation". The language for the claim limitation: *"loading only a data save operation"*, appears to be indefinite as to its meaning. A data save operation cannot be loaded, and loaded into what? The instructions to perform a data save operation can be loaded into memory and executed. The Examiner stated in the last Office Action that this claim limitation will be interpreted as a set of instructions that are loaded into a memory and are then executed to perform a data save operation. See 112 Rejections.

Ghosh discloses the capability to reboot a computing system with software that can perform a data save operation. The data will be saved after the next boot or activation procedure. The fact that the rebooted Ghosh software can perform additional functions

does not negate from the fact that Ghosh discloses software which is equivalent to kernel software that can perform a data save operation. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer (save) operation completed)

II. The rejection of claims 1, 3-7, 10, 11, 13-21, and 24-30 under 35 U.S.C. §102(e) as anticipated by Ghosh is improper because Ghosh fails to teach each element of the recited claims.

2. Applicant argues in paragraph [012] of Remarks that Ghosh does not teach or discloses each element of claim 1. Applicant argues that claim 1 is patently distinguished from Ghosh by claiming the elements, "...deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory .... " ; and "...the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel .... " ; and "...shutting down the processor in response to completing the data save operation .... ". *(Pages 12, 13)*

The Examiner respectively disagrees and will address each of these elements in the following responses.

3. Applicant argues in paragraph [014] of Remarks *that the Examiner erred by*

ignoring key limitations of claim 1 such as Ghosh does not disclose rebooting a processor with a data transfer kernel. (Page 13)

The Examiner disagrees. The Examiner did not ignore the indicated claim limitation. Ghosh discloses software that can be used to implement functions such as a data save (data transfer) operation utilizing writes to hard disk drive(s) with write acknowledgements and a system boot activation procedure (reboot). (Ghosh col. 1, lines 26-35; col. 10, lines 48-57: file written to hard disk; after receiving data, controller sends acknowledgement, software to perform data save operations) Ghosh discloses the interaction of cache controller software with Operating System (OS) software such as kernel type software. The data save software disclosed within Ghosh is analogous to the indicated kernel type software and therefore discloses software equivalent to kernel software. (Ghosh col. 1, lines 26-35; col. 10, lines 48-57) Ghosh discloses that the data save operation can be completed after the completion of a reboot procedure.

4. Applicant argues in paragraph [017] of Remarks that for claim 1, *Ghosh does not teach, deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory. (Page 14)*

The Examiner disagrees since a reboot which is a combined system shutdown and system boot procedure for a computing system will terminate all currently executing processes including the operating system software. A reboot procedure will have the

same result as *deterministically terminating all existing processes and the standard operating kernel*, which Applicant has defined as to quickly and definitely terminate all currently active processes without encountering problems such as due to a process stalling. A reboot procedure achieves this result since it definitely terminates all currently running processes including the operating system software plus any currently operating kernel software.

This particular reboot procedure occurs without a loss of data in volatile memory because the TMA (Transportable Memory Apparatus) enables the contents of the cache memory, which consists of volatile memory, to be recoverable after a reboot procedure. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; systems on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

In addition, Ghosh discloses that a reboot procedure can be caused by an abnormal condition that threatens the loss of data in volatile memory such as a power failure. (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device) A power failure is not a normal operating condition for a computing system and is considered an abnormal operating condition. In addition, a power failure can threaten to cause a loss of data within volatile memory when the power supply is interrupted.

5. Applicant argues in paragraph [021] of Remarks that for claim 1 *Ghosh does not disclose the element, the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel. (Page 15)*

The Examiner disagrees since Ghosh discloses software that can be used to implement functions such as data save operations utilizing writes to hard disk drive(s) with write acknowledgements in addition to a system boot activation procedure. (Ghosh col. 1, lines 26-35; col. 10, lines 48-57: file written to hard disk; after receiving data, controller sends acknowledgement, software to perform data save operations) Ghosh discloses the interaction of cache controller software with Operating System (OS) software such as kernel type software. The data save software disclosed within Ghosh is analogous to kernel type software and therefore discloses software equivalent to the indicated kernel software. (Ghosh col. 1, lines 26-35; col. 10, lines 48-57) Ghosh discloses that a data save operation can be completed after the completion of a reboot procedure.

6. Applicant argues in paragraph [022] of Remarks that for claim 1 *Ghosh does not teach the element, shutting down the processor in response to completing the data save operation. (Page 15)*

The Examiner disagrees since Ghosh discloses the capability to power up a computing system and the capability to power down a computing system. (see Ghosh col 9, likes 21-24: computing system is powered down or shutdown; computing system

is powered up or boot) The powered down sequence can be completed after the data save operation has been performed.

In addition, Ghosh discloses the capability to reboot a computing system with software that can perform a data save operation. The data will be saved after the next boot (or activation) procedure. (Ghosh col. 6, lines 52-64: stored data downloaded to one or more disk drives during next activation or power up sequence (system boot or reboot); data transfer (save) operation completed)

7. The Applicant argues in paragraph [023] of Remarks that claim 1 is not anticipated by Ghosh because Ghosh does not teach the elements. *"...deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory .... " ; "...the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel .... " ; and "...shutting down the processor in response to completing the data save operation ....".* *(Page 16)*

The Examiner disagrees since the Examiner successfully responded to Applicants arguments for these elements.

To begin with, the Examiner must reiterate that a reboot which is a combined system shutdown and boot procedure for a computing system will terminate all currently executing processes including the operating system software. This reboot procedure will have the same result as *deterministically terminating all existing processes and the*

standard operating kernel, which Applicant has defined as to quickly and definitely terminate all currently active processes without encountering problems such as due to a process stalling. The reboot procedure terminates all currently running processes including the operating system software plus kernel software.

Ghosh discloses that a reboot procedure can be caused by an abnormal condition that threatens the loss of data in volatile memory such as a power failure. A power failure is not a normal operating condition for a computing system and is considered an abnormal operating condition. In addition, a power failure can threaten to cause a loss of data within volatile memory when power is interrupted.

In addition, Ghosh discloses software used to implement the functions of the prior art invention such as a data save operation utilizing writes to hard disk drive(s) with write acknowledgements and system boot activation procedure. Ghosh discloses the interaction of cache controller software with Operating System (OS) software such as kernel type software. The data save software disclosed within Ghosh is analogous to kernel type software and therefore discloses equivalent kernel software. Ghosh discloses that a data save operation after the completion of a reboot procedure.

And, Ghosh discloses the capability to power up a computing system and the capability to power down a computing system. Ghosh also discloses the capability to perform a data save operation. The powered down sequence can be completed after a data save operation has been performed. And, Ghosh discloses the capability to reboot a computing system with software that can perform a data save operation. The data will be saved after the next boot (or activation) procedure.

8. Applicant argues in paragraph [023] of Remarks that *claims 10, 13, 17, 24, 28 include similar elements as claim 1 and are allowable for at least the same reasons as claim 1. (Page 16)*

The Examiner disagrees since independent claims 10, 13, 17, 24 and 28 have similar limitations as independent claim 1. The previous responses to arguments for independent claim 1 also answer the arguments against independent claims 10, 13, 17, 24 and 28.

9. Applicant argues in paragraph [023] of Remarks that *claims 3 - 7, 11, 14 - 16, 18 - 21, 24 - 27, 29, and 30 are allowable as depending from allowable claims. (Page 16)*

The Examiner disagrees since the arguments against the dependent claims are also answered by the response to independent claims.

III. The rejection of claims 1, 3-7, 10, 11, 13-21, and 24-30 under 35 U.S.C. §103(a) as obvious in view of Ghosh and Kamada is improper because Ghosh and Kamada fail to teach each element of claims 1, 3-7, 10, 11, 13-21, and 24-30.

10. Applicant argues in paragraph [032] of Remarks that *the Examiner erred in not considering elements of claim 1 such as deterministically terminating all existing processed and the standard operating kernel. (Page 19)*

The Examiner disagrees. The Examiner did consider all limitations of claim 1.

Ghosh discloses a reboot procedure. And, a reboot procedure is a combined system shutdown and boot procedure for a computing system that will definitely terminate all currently executing processes including the operating system software.

11. Applicant argues in paragraph [032] of Remarks that for Claim 1 *Ghosh does not disclose rebooting to terminate existing processing and a standard operating kernel. (Page 19)*

The Examiner disagrees since a reboot which is a combined system shutdown and boot procedure for a computing system will terminate all currently executing processes and the operating system software. This reboot procedure will have the same result as *deterministically terminating all existing processes and the standard operating kernel*, which Applicant has defined as to quickly and definitely terminate all currently active processes without encountering problems such as due to a process stalling. The reboot procedure terminates all currently running processes including the operating system software plus kernel software.

12. Applicant argues in paragraph [033] of Remarks that *Ghosh does not teach rebooting a processor in response to an abnormal operation condition that threatens a loss of data in volatile memory because with the computer system is off, there in no threat to the data in volatile memory. (Page 19)*

The Examiner disagrees since Ghosh discloses the shutdown of a computing system due to a power failure which is an abnormal operational condition. The loss of power to

a computing system does threaten the loss of data in volatile memory. Volatile memory must be supplied with power in order to ensure the integrity of data. The loss of power to volatile memory would result in the loss of data currently stored within volatile memory. Ghosh discloses the save or transfer of data to persistent storage after a system shutdown and boot procedure (reboot). (see Ghosh col 6, lines 56-64: during next activation (system boot) data downloaded from volatile memory to storage device)

13. Applicant argues in paragraph [034] of Remarks that Ghosh and Kamada do not teach: "*deterministically terminating all existing processes and the standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory". (Pages 19-20)*

The Examiner disagrees. Kamada is not used to reject this particular claim limitation. Ghosh is used to reject this particular claim limitation. And, Ghosh discloses a reboot which is a combined system shutdown and boot procedure for a computing system will terminate all currently executing processes and the operating system software. This reboot procedure will have the same result as *deterministically terminating all existing processes and the standard operating kernel*, which Applicant has defined as to quickly and definitely terminate all currently active processes without encountering problems such as due to a process stalling. The reboot procedure terminates all currently running processes including the operating system software plus kernel software.

This particular reboot procedure occurs without a loss of data in volatile memory

because the TMA (Transportable Memory Apparatus) enables the contents of the cache memory, which consists of volatile memory, to be recoverable after a reboot procedure. (Ghosh col. 6, lines 52-64: stored data downloaded to a memory storage device; systems on power up (reboot) supports save of data from cache memory to disk drives; col. 1, lines 26-35; col. 10, lines 48-57: cache controller interfacing with OS for file transfer (acks))

Ghosh discloses that a reboot procedure can be caused by an abnormal condition that threatens the loss of data in volatile memory such as a power failure. (Ghosh col. 10, lines 17-23: computer system shutdown in battery backup mode for cache memory; col. 6, lines 52-64: power failure (abnormal operating condition); next activation or power up (reboot) sequence stored data (in cache memory and saved during reboot procedure) is downloaded to storage device) A power failure is not a normal operating condition for a computing system and is considered an abnormal operating condition. And, a power failure can threaten to cause a loss of data within volatile memory when power is interrupted.

14. Applicant argues in paragraph [038] of Remarks that Ghosh does not disclose the element, *data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel. (Page 21)*

The Examine disagrees since Ghosh discloses software used to implement the functions of the prior art invention such as a data save operation utilizing writes to hard disk drive(s) with write acknowledgements and system boot activation procedure.

(Ghosh col. 1, lines 26-35; col. 10, lines 48-57: file written to hard disk; after receiving data, controller sends acknowledgement, software to perform data save operations) Ghosh discloses the interaction of cache controller software with Operating System (OS) software such as kernel type software. The data save software disclosed within Ghosh is analogous to kernel type software and therefore discloses kernel software. (Ghosh col. 1, lines 26-35; col. 10, lines 48-57) Ghosh discloses that a data save operation after the completion of a reboot procedure.

15. Applicant argues in paragraph [039] of Remarks that for claim 1, *Ghosh does not teach the element, shutting down the processor in response to completing the data save operation. Kamada also does not disclose this element. (Page 21)*

The Examiner disagrees since Ghosh discloses the capability to power up a computing system and the capability to power down a computing system. (see Ghosh col 9, likes 21-24: computing system is powered down or shutdown; computing system is powered up or boot) And, Ghosh discloses the capability to perform a data save operation. The powered down sequence can be completed after a data save operation has been performed. Kamada specifically discloses kernel type utilized in order to save data. (Kamada paragraph [0040], lines 7-9: kernel saves and manages class loader and thread group; kernel used to save data)

16. Applicant argues in paragraph [040] of Remarks that *Ghosh and Kamada do not disclose the elements, "...deterministically terminating all existing processes and the*

standard operating kernel by rebooting the processor with a data transfer kernel in response to an abnormal operating condition that threatens a loss of the data in the volatile memory .... " ; "...the data transfer kernel loading only a data save operation in response to rebooting the processor with the data transfer kernel .... " ; and "...shutting down the processor in response to completing the data save operation .... ".

The Examiner disagrees since the Examiner successfully responded to Applicants arguments against these elements.

To begin with, the Examiner must reiterate that a reboot which is a combined system shutdown and boot procedure for a computing system will terminate all currently executing processes including operating system software. This reboot procedure will have the same result as *deterministically terminating all existing processes and the standard operating kernel*, which Applicant has defined as to quickly and definitely terminate all currently active processes without encountering problems such as due to a process stalling. The reboot procedure terminates all currently running processes including the operating system software plus kernel software.

Ghosh discloses that a reboot procedure can be caused by an abnormal condition that threatens the loss of data in volatile memory such as a power failure. A power failure is not a normal operating condition for a computing system and is considered an abnormal operating condition. Plus, a power failure can threaten to cause a loss of data within volatile memory when power is interrupted.

In addition, Ghosh discloses software used to implement functions such as a data save operations utilizing writes to hard disk drive(s) with write acknowledgements and

system boot activation procedure. Ghosh discloses the interaction of cache controller software with Operating System (OS) software such as kernel type software. The data save software disclosed within Ghosh is analogous to kernel type software and therefore discloses equivalent kernel software. Ghosh discloses that a data save operation can be completed after the completion of a reboot procedure.

Ghosh discloses the capability to power up a computing system and the capability to power down a computing system. Ghosh also discloses the capability to perform a data save operation. The powered down sequence can be completed after a data save operation has been performed. And, Ghosh discloses the capability to reboot a computing system with software that can perform a data save operation. The data will be saved after the next boot (or activation) procedure.

17. Applicant argues in paragraph [042] of Remarks that claims 10, 13, 17, 24, and 28 are allowable for the same reasons as claim 1 and depending claims.

The Examiner disagrees since independent claims 10, 13, 17, 24 and 28 have similar limitations as independent claim 1. The responses to arguments for independent claim 1 also answer the arguments against independent claims 10, 13, 17, 24 and 28. In addition, the arguments against the dependent claims are also answered by the response to independent claims.

Conclusion

To shutdown a computing system due to an abnormal operating condition such as a

power failure is a well known in the art procedure. A system shutdown will terminate all currently executing processes and the operating system software. Ghosh discloses this type of shutdown procedure. To boot or reboot a computing system after a system shutdown is a well known in the art procedure. Ghosh discloses this reboot procedure. To shutdown a computing system as an operational function of the computing system is well known in the art. Ghosh discloses this type of system shutdown for a computing system. Ghosh discloses that the capabilities of the TMA enables the data contained within volatile memory to be saved after a system shutdown and system reboot. Performing a data save is a well known in the art procedure. Ghosh discloses a data save procedure.

All functions indicated by the claimed invention are well known in the art procedures and Ghosh discloses these functions.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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